

MONTHLY REPORTS

DATE: DECEMBER 10, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON LTD
SUBJECT: MONTHLY REPORT - NOVEMBER 1993

OVERVIEW -

November was a steady production month in the lab. Extra testwork included STH crush size column gold extraction data and relic tailings neutralization potentials for the quality assurance program. I took three vacation days on Nov. 24, 29 & 30.

RELIC TAILINGS -

The QA/QC Program continues with fly ash addition monitoring. An SRK representative is collecting the samples. Our lab is analyzing the samples for neutralizing potential and paste pH with the objective being to maintain a 3:1 NP:AP ratio. The samples are being sent to an outside lab for sulfur speciation by Leco furnace. A 2.52:1 NP:AP ratio has been calculated to date on a weighted average.

NEUTRALIZATION -

Cells 6 & 7 will be ready for compliance testing as soon as they can be drilled for solid sample testing (Dec 9-10).

SPENT ORE DRILL PROGRAM -

No spent ore samples were submitted for analyses this month.

SULFIDE TEST HEAP -

The Sulfide Test Heap is targeted for completion in mid-Dec. Regression Analysis was performed on the data points using three models. Gold extraction percentages of 57.0%, 61.7% and 61.8% were projected for a two year leach cycle.

Sulfide Test Heap material crushed to -1", -1/2" and -3/8" was put under leach to determine gold extraction at the various crush sizes. After 360 hours the -1" material is showing a cumulative gold extraction percentage of 20.52%, the -1/2" material is showing an average of 21.80% and the -3/8" material is showing 24.71%.

A 600 lb sample of sulfide ore, crushed to -3/8", is being prepared for shipment to Geobiotics. It will be bio-oxidized and then a split will be returned to the Brohm lab for column testing to determine enhancement of gold extraction, if any. Column tests comparing various other parameters will be run at Geobiotics.

c: Rod MacLeod

DATE: JANUARY 10, 1994
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - DECEMBER 1993

OVERVIEW -

December was a busy month in the lab with routine production samples and extra testwork monitoring. The Mistral centrifuge was retrofit with software to correct a safety problem with the lid opener at the centrifuge company's expense. Tim Storbeck used his remaining vacation days for 1993 on December 15; 27-30. I finished up my vacation days on December 17; 20-22.

RELIC TAILINGS -

Six relic tailings samples were submitted for analyses in December. Due to an overall calculated NP:AP ratio lower than 3:1, two test pit samples were collected and analyzed for paste pH and NP in the Brohm Lab. The test pit samples were 8 ft channel composites sampled vertically through the bench. The results showed an approximate NP value of 25 Ton CaCO_3 /Ton material which is close to a 3:1 NP:AP ratio. Due to questionable ABA results from Energy Labs in Billings, the remaining tailings pulps were sent to American Assay Laboratories for sulfur speciation and NP analyses.

NEUTRALIZATION -

Cells 6 & 7 passed compliance testing in mid-December and were off-loaded. Spent ore is being replaced on the empty cell space. Cells 1-4 are scheduled for neutralization starting in February. Thought should be given to removing the copper hydroxide sludge from the Detox Pond before or shortly after putting Cells 1-4 on neutralization so there will be adequate retention time for the oxidation reaction and room for the sludge generated during the detox cycle.

SPENT ORE DRILL PROGRAM -

No spent ore samples were submitted for analyses this month.

SULFIDE TEST HEAP -

The Sulfide Test Heap was drilled on December 10th and the test officially completed. The solid tailings samples were fire assayed and showed a final gold extraction of 53.9% after 441 days. This corresponds to a final gold extraction of 50.1% based on solution assays.

Sulfide Test Heap material crushed to -1", -1/2" and -3/8" continued to be leached to determine gold extraction at the various crush sizes. After 1320 hours on leach the -1" material is showing a cumulative gold extraction percentage of 28.47%, the -1/2"

material is showing an average of 30.82% and the -3/8" material is showing 33.02%.

A 600 lb sample of sulfide ore, crushed to -3/8", was sent to Geobiotics. It will be bio-oxidized and then a split will be returned to the Brohm lab for column testing to determine enhancement of gold extraction, if any. Column tests comparing various other parameters will be run at Geobiotics.

Testwork to date at Geobiotics includes:

- The comparison of bio-oxidized and non/bio-oxidized ore in small column tests for gold recovery.
- Bottle roll tests for the same.
- Correlation of iron concentration vs gold recovery.
- Bio-ox of various size fractions to determine rxn rates for each.

Geobiotics (Bill Kohr) was contacted for details on plans for a bulk sulfide bio-oxidation test, the objective being to determine the feasibility of bio-oxidation on a large scale basis. The following outlines his thoughts on the proposal.

1) At least 1000+ tons of ore but they are willing to do the entire stockpile depending on the available area and capital cost.

2) Six month bio-ox cycle and 6 month leach cycle.

3) Monitoring Bio-ox Progress: Flow in and out with solution assayed for eh, pH, DO, bacteria level, iron and copper. The ore would be drilled out from time to time and tested monthly to determine the extent of oxidation.

4) After bio-ox complete, off-load some ore and try different column leach treatments.

5) Application rate = $<0.005 \text{ gpm/ft}^2$. (The tested rates have been $<0.002 \text{ gpm/ft}^2$.)

6) Size = $<1/2"$. Remove fines if cost effective for rapid bio-ox of pyrite fines material and allow for faster bio-ox cycle with better flow characteristic in heap.

7) Heap must be aerated to control heat generation and provide O_2 to bacteria.

8) Temperature probes to monitor internal temperature. (Bacteria are temp sensitive- excess heat will kill the bacteria. This is probably one of the most crucial areas of concern.)

9) Start project in March 1994.

A five pound split of the material sent to Geobiotics was sent to Hazen Research for diagnostic testing at the request of Martin Quick. Herb Osborne was notified concerning the shipment.

Roberts and Schaefer requested information on the sulfide ore. Data sent to them included STH Load and Leach data; Mineralogical data provided by Paul Chamberlin; Degerstrom Report.

REVERSE OSMOSIS PRICING AND AVAILABILITY -

Various RO suppliers were contacted regarding the pricing and availability of RO units for treatment of our spring run-off. The companies contacted and results of the discussions are as follows: 1) Illinois Water Treatment - (U.S. Filter and C. Emery Nelson, Inc.) \$1,000,000 - 20 wks delivery. Pilot treatability testing recommended at cost of \$15,000. No lease/operator option available. 2) Memtek Corp. - \$500,000 - 16 wks delivery. No lease/operator option available. 3) Osmonics - \$400,000-\$500,000 w/3-6 mos treatability study. No reply on lease/operator option. 4) Zenon - No reply.

c: Rod MacLeod

DATE: NOVEMBER 2, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON *LD*
SUBJECT: MONTHLY REPORT - OCTOBER 1993

OVERVIEW -

October was a steady month in the lab including routine process and bullion assays. MicroLab Services cleaned and calibrated the lab, process and refinery balances on October 5th. Tim Storbeck took a day of vacation on October 13th and I was on vacation from October 8-13.

RELIC TAILINGS -

A bucket leach amendment study was completed this month to determine the effectiveness of amending the relic tailings with fly ash. The test results closely resemble the data collected from a weathering cell study done in August showing that the fly ash neutralizes the acidity.

A QA/QC Program has been set up to monitor the fly ash addition to the relic tailings as they are being moved. An SRK representative is collecting the samples. Our lab is analyzing the samples for neutralizing potential and paste pH with the objective being to maintain a 3:1 NP:AP ratio. The samples are being sent to an outside lab for sulfur speciation by Leco furnace.

NEUTRALIZATION -

As South Heap continues on neutralization it appears, from the detox curve, that Cell #7 will be ready for compliance testing at the end of the month. Cell #6 seems to be lagging behind (probably due to the high clay content of the heap) and won't be ready for compliance testing until mid December.

SPENT ORE DRILL PROGRAM -

Samples from the Spent Ore Drill Program were composited and bottle rolled to determine how the spent ore leaches with the present barren solution matrix. After 10 days on the rolling device the gold recovery, based on fire assay, averaged in the neighborhood of 50%.

SULFIDE TEST HEAP -

The Sulfide Test Heap has been on leach for a little over a year and is currently winding down to a finish. We are in the process of obtaining finalization data and a summary report will be prepared this month.

Sulfide Test Heap material crushed to -1/2" and -3/8" was put under leach to determine gold recovery at the various crush sizes.

A column of "as is" material from the Brohm Crusher is being leached for comparison purposes.

Sulfide ore samples were sent to Geobiotics and the USBM for bio-oxidation testwork. Preliminary data from Geobiotics indicate that the bacteria grow well on the ore. Column tests are being run to determine if enhanced recovery can be obtained with bio-oxidation.

TESTWORK -

A study was conducted on Dakota Maid Pit Water to determine the amount of slaked lime needed to raise the pH. The results showed that approximately 13 Tons of 50% slaked lime per one million gallons of pit water would be needed to raise the pH to 7.

Oolitic limestone was investigated for its use as a buffer for acidic water. The test results indicated that it performed no better than -1/4" limestone although it had a more uniform bed which allowed better percolation of fluids. Five hundred pounds of Oolite has been obtained for a field test in Ruby Gulch.

c: Rod MacLeod
Dale Shay

DATE: SEPTEMBER 7, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON ^{LD}
SUBJECT: MONTHLY REPORT - AUGUST 1993

OVERVIEW -

August was a steady month in the lab including routine process assays and bullion along with spent ore assays from the drilling program and testwork for the environmental department. Neutralization continued on South Heap and eight Slag Tails were prepped and assayed.

BASE ADDITIVES -

Rod MacLeod and I toured the Dacotah Cement Plant at the beginning of the month. It appears that their loading facility must be modified in order to collect kiln dust at the site. A Neut Potential was done in the Brohm Lab on the wet kiln dust. It = 849 T CaCO_3/KT material which is very similar to the NP of the dry kiln dust.

Fred Carl (BHP) is waiting for our reply pertaining to the starting date for fly ash removal.

Weathering Cell testwork data was collected on amended relic tailings and is discussed under TESTWORK.

NEUTRALIZATION -

South Heap continues on neutralization. The wad cyanide level dropped from about 500 mg/L to 60 mg/L during the month. At the present rate of detox it is possible that South Heap may be ready for compliance testing during the first part of October.

SPENT ORE DRILL PROGRAM -

The spent ore drilling program continued this month to investigate the idea of re-leaching the spent ore. Thirty-seven samples have been assayed to date having an average fire assay grade of .013 opt Au and an average cyanide soluble grade of .009 opt Au.

TESTWORK -

Weathering Cell testwork data was collected on amended relic tailings showing that the samples amended with fly ash to +20 T CaCO_3/KT material equivalent had their acidity neutralized. The testwork report was given to Rod, Dale and Lance.

Bucket Leach tests are being set up to further test fly ash amendment. Completion is targeted for the end of September.

Dolite, an oolitic limestone, is being investigated for its use as a pH buffer of acidic water. It is being run in parallel with -1/4" limestone fines. Not enough data has been collected at present to make any judgement on its application.

c: Roderick MacLeod

DATE: AUGUST 2, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON LLD
SUBJECT: MONTHLY REPORT - JULY 1993

OVERVIEW -

July was a busy month in the lab including routine process assays and bullion along with RO monitoring and spent ore assays from the drilling program. Neutralization was started on South Heap with peroxide being added on July 9th.

The lab centrifuge went down at the beginning of the month. Upon closer examination it was determined that the power supply was over-amping the instrument. BHP turned down the power to the entire minesite. The lender centrifuge was returned and the lab centrifuge is working fine.

Tim Storbeck took 4 days of vacation this month from 7/6-7/9.

REVERSE OSMOSIS UNIT -

The RO unit was upgraded on July 13th to deliver an estimated 60 gpm final product. Before the upgrade the RO was averaging 37 gpm. After the upgrade an average 58 gpm was obtained. 1.61 million gallons of final product water was sent to the head tank in July. Daily monitoring continued and state compliance samples were taken every 500,000 gallons. The wad cyanide rejection continued to stay above 97% while the copper and calcium rejections remained well above 99.5%. The in-line copper filters were changed more often and chemical usage was up due to the increased flow rate. The RO was taken off-line at the end of the month and is being prepared for removal from the minesite in early August. The surge pond level is at 2.5 million gallons.

Discharged Water - (as of August 1st 02:20 hr)

Cum Gallons	:	4,981,845
Cum Run Time (hr)	:	2,067
% On-Line	:	78%
Average GPM (On-Line):		40
Average GPM (Overall)		31

Reagent Usage - (per day) - 111 days		per 1000 gallons Final Product Water
50% NaOH (gal)	:	5 .11
12% NaOCl (gal)	:	66 1.48
H2SO4 (gal)	:	1 .02
CO2 (lbs)	:	650 14.48

BASE ADDITIVES -

Letters of Agreement were signed with Air Products and Black Hills Power and Light for obtaining their basic by-products for addition to our relic tailings and waste dump reclamation. The BHP fly ash stockpile was sampled and submitted to Mid-Continent Testing for TCLP and 3050A analyses. A Neut Potential analysis was done in the Brohm lab. NP = 345 T CaCO3/ KT. The TCLP and 3050A results were very similar to the original test results. Vanadium and Boron are being run on the 3050A liquor at the request of SRK.

Fred Carl (BHP) is waiting for our reply pertaining to the starting date for fly ash removal.

Weathering Cell testwork data will be collected on ammended relic tailings during the first week of August.

Representatives of Dacotah Cement toured our facility on July 23rd. An invitation was extended for a reciprocal tour of the cement plant. Plans for obtaining their kiln dust can be discussed at that time.

NEUTRALIZATION -

South Heap was put on the neutralization circuit at the end of June and recircled with no peroxide addition. It was determined by July 13th that zero cyanide destruction was being achieved. Peroxide was added at that point at a rate of 550 ml/min. Due to limited cyanide destruction the rate of H2O2 injection was increased to 1500 ml/min on July 15th. The heap effluent wad cyanide was decreased from 950 ppm to 550 ppm by July 25th. The peroxide was turned back to 550 ml/min to conserve the product until delivery on August 2nd. The rate of H2O2 injection will be increased at that time to achieve the minimum amount of time on neutralization. It appears the heap will be ready for compliance testing in early November.

SPENT ORE DRILL PROGRAM -

A spent ore drilling program commenced this month to investigate the idea of releaching the spent ore. Nineteen samples have been assayed to date having an average fire assay grade of .011 opt Au and an average cyanide soluble grade of .008 opt Au. The higher grades are located at the face of the spent ore dump.

c: Roderick MacLeod

DATE: JULY 7, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON *LLD*
SUBJECT: MONTHLY REPORT - JUNE 1993

OVERVIEW -

June was a steady month in the lab including daily assays, bullion and slag, as well as RO unit monitoring.

REVERSE OSMOSIS UNIT -

The RO unit has been discharging water on a steady basis this month. 1.24 million gallons of final product water was sent to the head tank in June. Daily monitoring continues and state compliance samples are being taken every 500,000 gallons. The wad cyanide rejection has been consistently above 97%. The copper and calcium rejections remain well above 99.5% indicating that the system continues to operate within its specified parameters. The unit has been producing an average 37 gpm this month.

Discharged Water - (as of July 1st 00:00 hr)

Cum Gallons	:	3,366,875
Cum Run Time (hr)	:	1,505
% On-Line	:	79%
Average GPM (On-Line):		37
Average GPM (Overall):		29

Reagent Usage - (per day) - 80 days

50% NaOH (gal)	:	7
12% NaOCl (gal)	:	75 50
H2SO4 (gal)	:	1
CO2 (lbs)	:	600

BASE ADDITIVES -

Fred Carl (BHP) visited the minesite this month to see where we plan to use the fly ash from the Ben French Power Plant. A Letter of Agreement was signed by both companies stating BHP's commitment to give us their product. A sample from the stockpiled fly ash will be collected and re-tested for TCLP, 3050A and neutralizing potential.

The marketing VP from Pete Lien got involved in the communication about their by-products. The material now has \$\$\$ attached to the deal. They were told that we are not interested in paying for their waste products at this time.

Gene Nelson (Dacotah Cement) is interested in trying to work out something similar to our arrangement with BHP to give us their kiln dust. He plans to visit our minesite in the near future to discuss the subject.

A Letter of Agreement was drafted between Brohm and Air Products for a commitment from Air Products to receive their slaked lime. I have not seen the letter.

c: Roderick MacLeod

DATE: JUNE 2, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - MAY 1993

OVERVIEW -

May was a steady month in the lab including daily assays, bullion and slag, as well as RO unit monitoring.

REVERSE OSMOSIS UNIT -

The RO unit has been discharging water on a steady basis this month. 1.45 million gallons of final product water was sent to the head tank in May. 100,000 gallons of "clean" water was dumped from the head tank into the Surge Pond when the tank became contaminated with flush solution. No contaminated water was discharged. Daily monitoring continues and state compliance samples are now being taken every 500,000 gallons. The wad cyanide rejection continues to stay above 97% while the copper and calcium rejections remain at 99.9% indicating that the system is operating well within its specified parameters. The unit has been producing an average 39 gpm this month. Denver Mineral Engineers were told on May 28th to discontinue upgrade plans.

Discharged Water - (as of June 1st 00:00 hr)

Cum Gallons	:	2,126,505
Cum Run Time (hr)	:	938
% On-Line	:	79%
Average GPM	:	38

Reagent Usage - (per day) - 50 days

50% NaOH (gal)	:	7
12% NaOCl (gal)	:	78
H2SO4 (gal)	:	1
CO2 (lbs)	:	600

c: Roderick MacLeod

DATE: JUNE 7, 1993
TO: ROD MACLEOD
FROM: LAURA DAMON *LD*
SUBJECT: MAY 1993 MONTHLY REPORT ADDITION

As per your request for additional information, the following items are being clarified.

BASE AMMENDMENT STATUS -

Testwork (3050A and TCLP) has been completed for the various base additives being investigated for waste dump ammendment purposes.

Letters of Understanding simply stating the suppliers commitment to supply us with their base additives are waiting your approval to be sent to Air Products and BHP (Ben French Power Plant). Trucking arrangements with BHP are still negotiable.

I am expecting a call from the chief engineer at Pete Lien tomorrow. I hope to set up the same supply commitment arrangement as with the other companies.

Kirk Fly Ash has basically been ruled out due to its poor NP.

Dakotah Cement is on hold due to a monetary charge for the product.

RO COST -

Arrowhead's total cost for April and May was \$34450.59. The cost has been adjusted for a 100,000 gallon credit from having to dump the head tank back into the surge pond. I estimate approximately \$150 per day in reagent cost for a total of \$7500 in 50 days. I will have exact figures tomorrow.

(\$17 / 1000 gal)

SULFIDE TEST HEAP -

As of May 31st the total recovery on STH is 39.5%.

c: Jim Thompson

DATE: MAY 3, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON *LLD*
SUBJECT: MONTHLY REPORT - APRIL 1993

OVERVIEW -

April was a busy month in the lab with the extra work-load associated with the start up of the RO unit and sample prep and analyses for waste dump remediation purposes.

REVERSE OSMOSIS UNIT -

The RO Unit has been operating smoothly this month. It started up the week of April 5th. After a week of testing and monitoring, we began discharging water on April 12th. Daily monitoring schedules have been set up and state compliance samples have been taken every 100,000 gallons. The wad cyanide rejection has been consistently at 97-98% and copper and calcium rejections are 99-100%. All the state compliance samples have been well within the allowable limits. The unit has been producing an average 35 gpm. Another pump will be added in May resulting in an increased gpm output.

Discharged Water - (as of April 30th 00:00 hr)

Cum Gallons	:	676,760
Cum Run Time (hr)	:	325
% On-Line	:	77%
Average GPM	:	35

Reagent Usage - (per day)

50% NaOH (gal)	:	8
12% NaOCl (gal)	:	55
H2SO4 (gal)	:	1
CO2 (lbs)	:	650

INSTRUMENTATION FOR ENVIRONMENTAL ANALYSES -

Instrumentation needed to adequately monitor Ruby Gulch for compliance purposes was investigated. A graphite furnace is needed to analyze elements to the required detection limits. Service Technologies, Inc has a Perkin-Elmer 5000 with a graphite furnace at a cost of approximately \$30,000. They would take our PE 2380 as a trade-in to reduce the cost. We must know the sample load and schedule to determine the feasibility of working with one AA.

WASTE DUMP REMEDIATION INFORMATION FOR SRK -

Various base additives were investigated for waste dump acid amendment purposes. Waste rock samples were analyzed for ABA to determine the amount of base additive required for amendment. Spent ore, topsoil and oxide rocks had ABA and soil analyses done to determine the feasibility of their use in a capillary barrier. The table below delineates the progress made to date.

Base Additives -

Type	Location	Material Cost	Trucking/ Loading Cost	Amount Available	TCLP	Testwork	
						SW 846 3050A	NP T CaCO ₃ / KT
Ca(OH) ₂	Air Products	\$0	Yes	1200- 2400 Tons	sent to SRK	to be done	to be done
Fly Ash	Ben French BHP	\$0	Negotiable	6000- 7000 Tons + 12T/day	in progress	in progress	466.8
Fly Ash	Kirk BHP	\$0	Negotiable	2000- 3000 Tons + 16T/day	sent to SRK (note Al values)	in progress	112.8
Fallout	Kirk BHP			(material is very magnetic so has been ruled out)			90.9
Kiln Dust	Dakotah Cement	>\$10/Ton	Yes	40-50 T/day	sent to SRK	in progress	829.1
Lime Kiln Dust (Baghouse)	Pete Lien	\$0	Yes	8 T/day	not available	-	913.5
				(Limestone & Coal Chemical Analysis sent to SRK)			
Lime Kiln Dust (Multicone)	Pete Lien	\$0	Yes	16 T/day	not available	-	961.8
				(Limestone & Coal Chemical Analysis sent to SRK)			
Soda Ash	FMC	\$100/T	Yes	(F.O.B. Green River, Wyoming)			

Sample Analyses -

Sample Analyses -

Soil Analyses			Soil Analyses		
Sample	ABA		Sample	ABA	
WR-1	X		TS-1		X
WR-2	X		TS-2		X
WR-3	X		TS-3		X
WR-4	X		TS-4		X
WR-5	X		TS-5		X
WR-6	X		TS-6		X
SO-1	X	X	RR-1	X	
SO-2	X	X	RR-2	X	
SO-3	X	X	RR-3	X	
SO-4	X	X	LANG-1	X	
SO-5	X	X	LANG-2	X	
SO-6	X	X			

Waste Rock and Spent Ore ABA results have been sent to SRK. Soil Analyses, RR and LANG ABA results are pending.

c: Rod MacLeod
Lance Hubbard

DATE: FEBRUARY 1, 1993

TO: JIM THOMPSON

FROM: LAURA D. DAMON *LLD*

SUBJECT: MONTHLY REPORT - JANUARY 1993

NUMBER OF ASSAYS	
Fire Assay Samples	73
Bullion Samples	39
Daily Leach Samples	290
Bottle Rolls	4
Column Samples	62

The last of the crusher samples were assayed during the first week of January. Slag tails are being assayed and old tailings samples bottle rolled for gold recovery determination. The STH columns are at the final stages of their leaching cycle.

██████████ was taken to the hospital on January 20, 1993, due to an overexposure to cyanide. He was given first aid on the way to the hospital, treated and released from the hospital and returned to work. He apparently got the overdose when taking bottle roll pH's. The pH apparatus was moved into the fume hood to prevent any reoccurrence.

The AA autosampler reset switch became defective this month. The unit was sent to ST² and is in the process of being fixed.

LD:sm

DATE: JANUARY 13, 1993
TO: JIM THOMPSON
FROM: LAURA DAMON *LLD*
SUBJECT: MONTHLY REPORT - DECEMBER 1992

NUMBER OF ASSAYS	
Fire Assay Samples	239
Bullion Samples	51
Daily Leach Samples	279
Old Tails	6
Blast Holes	246

December was a slow month in the lab. Martha Wierzbicki and Robin Symonds were laid off as of December 31, 1992.

Old Tailings samples were gathered during their removal and showed an average moisture (10%); Au head based on fire assay (.026); Au head based on NaCN shake (.013); and Net APP (-3.8).

Tim Storbeck finished his 1992 vacation days December 28 - 30, 1992 and Robin Symonds took her remaining vacation December 18; 21-24.

/vc

DATE: DECEMBER 2, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON *LJD*

SUBJECT: MONTHLY REPORT - NOVEMBER 1992

NUMBER OF ASSAYS	
Fire Assay Samples	222
Bullion Samples	45
Daily Leach Samples	240
Tails	46
Bottle Roll Assays	5
Blast Holes	266

/vc

DATE: SEPTEMBER 8, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON YLD

SUBJECT: MONTHLY REPORT - AUGUST 1992

NUMBER OF ASSAYS	
Fire Assay Samples	761
Bullion Samples	78
Daily Leach Samples	247
Carbon Solution Samples	0
Neutralization Samples	0
Blast Holes	938
Exploration Samples	41
GRMC	369

The RO unit left our site August 10, 1992 with a total of 2,145,150 gallons of "clean" water discharged.

The Spent Ore and Crusher Heap Barrels outside the lab were emptied and cleaned. Cyanide solid centrifuge tube clean-up was started.

The Neutralization Pond was sampled and samples sent out for various analyses. Results are pending.

A G-D Resources Carbon Shipment of carbon was analyzed and settled on.

Dan Herbst temporary position ended on August 21, 1992.

Tim Storbeck took a day of vacation on August 20, 1992.

Robin Symonds took a day of vacation on August 31, 1992.

/vc

DATE: AUGUST 3, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON *LD*

SUBJECT: MONTHLY REPORT - JULY 1992

NUMBER OF ASSAYS	
Fire Assay Samples	725
Bullion Samples	72
Daily Leach Samples	239
Carbon Solution Samples	45
Neutralization Samples	13
Blast Holes	964
Exploration Samples	704
RO Wads	225 205
Spent Ore	1

July was a steady production month in the lab with the added exploration samples. Along with prepping all the exploration holes, we are also firing as many samples as possible.

The RO unit ran all month and ended with a total 2,145,150 gallons of "clean" water discharged.

Jody Cerkoney moved to Golden Reward at the beginning of the month.

██████████ returned to work July 13 from disability leave.

Tim Storbeck took two days of vacation July 1, 2 and Martha Wierzbicki took a day of vacation July 10.

DATE: JULY 1, 1992
TO: JIM THOMPSON
FROM: LAURA DAMON LLD
SUBJECT: MONTHLY REPORT - JUNE 1992

NUMBER OF ASSAYS	
Fire Assay Samples	705
Bullion Samples	72
Daily Leach Samples	229
Carbon Solution Samples	112
Neutralization Samples	52
Blast Holes	1244
Exploration Samples	305
RO Wads	200

June, being a slightly slower production month, afforded us to keep pace with personnel upsets.

██████████ was on disability leave for the entire month. She is expected to return to work July 13.

██████████ resigned her position as Sample Technician on June 23 after a 3-day suspension for disruptive behavior.

Dan Herbst has continued to fill-in for the various lab positions as needed. He has been an asset to the lab this summer.

Jody Cerkoney has opted to join the lab personnel as a full-time Sample Technician. He replaces Deb Sterna.

Martha Wierzbicki took a day of vacation on June 18.

After testwork was completed and references checked a comparison was made between Betz & Drew Chemical Companies and their agglomeration polymers. I have recommended using the Drew polymer to meet our agglomeration needs.

The lab personnel started prepping Exploration Samples for the 1992 Anchor Hill Drilling program. It is expected that approximately 2500 samples will be prepped in our lab and sent to Bondar Clegg for analysis.

The RO unit has been making "clean" water this month. Approximately 1 million gallons of process water has been discharged. We hope to get rid of about 2 million more gallons in July.

/vhc

DATE: June 1, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON LLD

SUBJECT: MONTHLY REPORT - MAY 1992

NUMBER OF ASSAYS	
Fire Assay Samples	998
Bullion Samples	38
Daily Leach Samples	230
Carbon Solution Samples	124
Neutralization Samples	67
Blast Holes	1154
Anchor Hill Shakes	
Exploration Samples	
Bottle Roll Assays	87
RO Wads	220

May was a month of steady production in the lab. Robin Symonds has continued cross-training in the wet lab. Both Robin and Deb Sterna have received some training in Fire Assay.

██████████ became ill at the end of the month. She has had surgery and will not be able to return to work for 3-6 weeks. This will put her return date somewhere between the end of June and mid July.

Dan Herbst was hired May 27, 1992 as a metallurgical lab assistant. He is now being trained to fill in for Robin during her absence.

Several crusher samples were tested for the difference in overall gold recovery between a regular crush sample and fine (-1/4") crush sample. No appreciable difference has been noted in the samples tested thus far.

Both Betz and Drew Chemical Companies tested their respective agglomeration aids for use with our -1/4" sulfide stockpile ore. The data is being summarized and evaluated for use if a tertiary crush is implemented.

Efforts continue to put the RO unit on-line. We are hoping to have the state test the final product water for compliance purposes by the end of the week. We will be able to send treated water to the head tank at that time.

Martha Wierzbicki took 3 days of vacation this month - 5/11/92, 5/12/92 and 5/21/92. Robin Symonds took 1 vacation day on 5/22/92.

/vc

DATE: MAY 5, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON *LLD*

SUBJECT: MONTHLY REPORT - APRIL 1992

NUMBER OF ASSAYS	
Fire Assay Samples	1087
Bullion Samples	31
Daily Leach Samples	207
Carbon Solution Samples	120
Neutralization Samples	40
Blast Holes	1178
Anchor Hill Shakes	28
Exploration Samples	48
Bottle Roll Assays	104
RO Wads	96

All lab personnel attended their 8 hour MSHA safety training refresher course at the beginning of the month.

Arrowhead representatives arrived April 8 to run the RO unit. Due to preg solution mixing with the filtered barren solution, the RO membranes plugged. The membranes are in the process of being replaced and should be in line during the week of May 11.

A polymer agglomeration product from Betz is being tested at the moment and being considered as an alternative to agglomerating with either water or cement.

Two crusher samples were bottled rolled this month comparing their regular crush to a fine (-1/4") crush product for gold recovery. The test results indicate that no significant improvement in overall recovery is obtained from the finer crushed product. Additional samples are being tested at this time.

Sulfide Stockpile Ore and a sample containing a lot of copper are also being bottle rolled at this time.

Additional testwork includes NaCN shakes on ore that is giving very low shake gold values compared to the fire assay. There seems to be a correlation between the shake/fire discrepancy and the amount of copper in the sample. The results are being investigated.

Martha Wierzbicki took 2 days of vacation this month - 4/20/92 and 4/30/92.

/vc

DATE: APRIL 3, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON *LLD*

SUBJECT: MONTHLY REPORT - MARCH 1992

NUMBER OF ASSAYS	
Fire Assay Samples	854
Bullion Samples	64
Daily Leach Samples	217
Carbon Solution Samples	108
Neutralization Samples	89
Blast Holes	1710
Anchor Hill Shakes	642
Exploration Samples	174
Bottle Roll Assays	80

March was a steady production month in the lab.

Bottle rolls were done on the -3/8" sulfide material sent back from Remco. The bottle roll results indicate about 45% gold recovery.

The NaCN leach shakes were finished on the Anchor Hill exploration pulps. The data are being analyzed.

A representative from Microlab Services was on site March 24 to do balance calibration and maintenance.

Martha Wierzbicki took a day of vacation on March 5.

/rl

DATE: MARCH 3, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON LLD

SUBJECT: MONTHLY REPORT - FEBRUARY 1992

NUMBER OF ASSAYS	
Fire Assay Samples	735
Bullion Samples	53
Daily Leach Samples	192
Carbon Solution Samples	116
Neutralization Samples	80
Blast Holes	1775
Spent Ore	2

Lab operations ran smoothly during the month of February. All lab personnel had blood lead tests with results pending. Martha Wierzbicki took one day of vacation on February 28. I attended the annual SME Conference February 24-26.

Hot cyanide shake assays continue to be run on the ore from Anchor Hill. The data are being tabulated and should be completed by the end of March.

We are in the process of setting up a column leach study on the 3/8" sulphide ore returned from Remco. A good idea of the leachability of the ore should be obtained by the end of March.

Myron Andersen and I discussed the need for the RO unit to be operational in March (there are four months of operation left on the contract). We decided that the four months would be best used April-July. Pete Goodwin is looking into the possibility of terminating the contract if it appears the unit won't be needed to rid an excess water supply.

I have been conducting an on-going report on ore fraction analyses of gold for the past seven cells. Preliminary results show 30-40% of the spent ore gold left in the minus 1/4" fraction as well as 30-40% of the spent ore gold left in the plus 1" fractions. A more detailed report will be finished by next week.

/rl

DATE: FEBRUARY 4, 1992

TO: JIM THOMPSON

FROM: LAURA DAMON LLD

SUBJECT: MONTHLY REPORT - JANUARY 1992

NUMBER OF ASSAYS	
Fire Assay Samples	879
Bullion Samples	42
Daily Leach Samples	197
Carbon Solution Samples	126
Neutralization Samples	82
Blast Holes	1771
Spent Ore	2

A program was implemented this month to get a better handle on pH control for the crusher sample. The crusher samples are bottle rolled in the usual manner with continued monitoring for an additional five days. This gives us an idea of how much the pH may be lowered during the leach cycle to indicate the best initial pH range.

NaCn leach shakes were done on composited Anchor Hill high grade material. The results were favorable indicating up to 60% recoverable gold in the samples. More pulps have been pulled and will be assayed, as time permits.

Robin Symonds continues cross-training in the Wet Lab.

/rl

MONTHLY REPORT

DATE: JANUARY 3, 1991
TO: JIM THOMPSON
FROM: LAURA DAMON *LD*
SUBJECT: MONTHLY REPORT - DECEMBER 1991

Number of Assays	
Fire Assay Samples	519
Bullion Samples	48
Daily Leach Samples	189
Carbon Solution Samples	124
Neutralization Samples	73
Pit Development	117
Blast Holes	1183
Exploration	438
Column Testing Samples	20

A ST² technician serviced the AA units this month during their bi-annual inspections. Both instruments were cleaned. The lab AA had its printer switch and auto sampler belt replaced. The instruments are in good working order.

An annual first aid refresher meeting was held this month with all lab personnel attending. We discussed appropriate procedures for cuts, bleeding, burns, shock, chemical contamination, eye mishaps, and CPR. Safety precautions in the use of cyanide were also discussed along with the Cyanide Safety Evacuation Plan.

Slower production in the lab afforded us the opportunity to clean the lab and start cross-training between lab departments. Lab personnel were also able to attend a "Pit Tour" to gain more insight into Blast Hole mining activities.

Martha Wierzbicki finished up her 1991 vacation days the last four days of the month. Bob Sherman's temporary position ended December 13.

MONTHLY REPORT

DATE: DECEMBER 3, 1991
TO: JIM THOMPSON
FROM: LAURA DAMON *LLD*
SUBJECT: MONTHLY REPORT - NOVEMBER 1991

Number of Assays	
Fire Assay Samples	764
Bullion Samples	16
Daily Leach Samples	191
Carbon Solution Samples	120
Neutralization Samples	61
Monthly Composites	0
Blast Holes	2025
Exploration	1050
Bottle Rolls	8
Spent Ore	2
Column Testing Samples	149

November was another extremely busy production month for the lab. A near record number of blast hole samples were processed.

Representatives from Interlox America were here to discuss enhanced neutralization patenting plans. A joint paper will be presented at the Randol Gold Forum '92 by Alastair McNeillie and myself.

Robin Symonds was hired November 1 to fill the vacant Sample Technician position. Dave Sherman resigned his position in the lab in lieu of a maintenance job. Debby Sterna was hired to replace Dave. Bob Sherman was hired as an Olsten temporary to prepare exploration samples.

Dave Sherman took vacation November 1, 4-5, and Martha Wierzbicki took vacation November 26-27.

MONTHLY REPORT

DATE: NOVEMBER 5, 1991
TO: JIM THOMPSON
FROM: LAURA DAMON LLD
SUBJECT: MONTHLY REPORT - OCTOBER 1991

Number of Assays	
Fire Assay Samples	1013
Bullion Samples	39
Daily Leach Samples	214
Carbon Solution Samples	124
Neutralization Samples	62
Monthly Composites	30
Blast Holes	2048
Exploration	1071
Bottle Rolls	10
Spent Ore	1
Column Testing Samples	172

October was an extremely busy production month for the lab.

The RO unit was tested during October. It was decided to use the existing Fire Water Tank for dispersal of the RO permeate. The unit has been winterized.

The Interlox sulphide test columns finished leaching and were put on neutralization. The final gold recovery was about 38% for both columns.

All lab personnel had blood lead tests this month. The results are pending

██████████ was terminated for falsifying assay results. Robin Symonds was hired to replace him.

Martha Wierzbicki took one day of vacation.

MONTHLY REPORT

DATE: OCTOBER 2, 1991
TO: JIM THOMPSON
FROM: LAURA DAMON *LD*
SUBJECT: MONTHLY REPORT - SEPTEMBER 1991

Number of Assays	
Fire Assay Samples	996
Bullion Samples	54
Daily Leach Samples	215
Carbon Solution Samples	112
Neutralization Samples	44
Monthly Composites	30
Blast Holes	1923
Exploration	571
Pit Development	55

September was a very busy month for the lab.

The balances on the property were cleaned and calibrated by Microlab Services on September 10.

The RO double-pass unit was on site September 3. Representatives from Arrowhead were here on September 10 to explain how the unit works. The Arrowhead operator has the unit working properly and making "clean" water. The permeate was tested and passed all required DENR parameters.

██████████ was sent to the clinic to have her hands and arms looked at after complaining about numbness and cold hands. Dr. Ross said she has carpal tunnel syndrome symptoms and has given her braces to wear on her hands at night. He said the numbness in her fingers was from smoking. I believe the carpal tunnel syndrome symptoms could be from her stirring and pouring activities in Fire Assay.

██████████ was suspended for three days without pay (September 27, 30, and October 1) for not following procedures in the lab.

Dave Sherman took two vacation days (September 25-26).

rl

MONTHLY REPORT

[illegible]

DATE: SEPTEMBER 5, 1991

TO: JIM THOMPSON

FROM: LAURA DAMON LLD

SUBJECT: MONTHLY REPORT - AUGUST 1991

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

Number of Assays

Fire Assays	1158
Bullion	43
Daily Assays	253
Neutralization	266
Monthly Composites	30
Blast Holes	1633
Exploration	678
Bottle Rolls	18
Specials	9

Lab operations ran smoothly during the month of August.

Representatives from Interlox visited Brohm early in the month. An agreement was reached for the wording on the Secrecy Agreement and the set up for column testwork on the sulfide ore was discussed.

A decision still needs to be made concerning the disposal of the chemicals cleaned up from the Coppel Mill site.

A flow meter and sampling port on our neutralization return line is still needed in order to optimize hydrogen peroxide usage.

Bill Atkinson was awarded the Crusher Helper position. His last day as Sample Technician was August 30. No replacement will be considered at this time.

Mike McFarland took ten vacation days on August 8-9, 14-16, and 19-23.

MONTHLY REPORT

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

DATE: AUGUST 5, 1991

TO: JIM THOMPSON

FROM: LAURA DAMON *LJD*

SUBJECT: MONTHLY REPORT - JULY 1991

[illegible]

Number of Assays

Fire Assays	792
Bullion	27
Daily Assays	253
Neutralization	266
Monthly Composites	30
Blast Holes	1387
Pit Development	27
Bottle Rolls	12

Four 55-gallon drums of discarded miscellaneous unknown chemicals were cleaned up from the Coppel Mill area this month. The samples were analyzed by Twin City Testing and shown to contain overlimit amounts of arsenic, lead, mercury, silver, barium and cadmium to be disposed of indiscriminately. Due to the small amount of material in the drums, it may be feasible to mix the contents with our ore on the heap leach to dispose of the chemicals.

Due to the lower limits of WAD cyanide in our process solution, the time to neutralize has been about halved. Leaching with lower amounts of cyanide in our process should be considered as an operational procedure. The heaps would spend more time on leach and less time on neutralization, resulting in less reagent cost for cyanide and hydrogen peroxide. It appears that the cyanide concentration in our leach solution does not effect the overall gold extraction according to our recovery data to date. A balance must be determined between days on leach and days on neutralization at a cyanide concentration that is feasible for running the Merrill-Crowe system.

A flow meter and sampling port for our neutralization return is still needed in order to optimize hydrogen peroxide usage.

Dave Sherman took vacation days on July 1, 2 and 3.

MONTHLY REPORT

[illegible]

DATE: JULY 8, 1991

TO: JIM THOMPSON

FROM: LAURA DAMON *LD*

SUBJECT: MONTHLY REPORT - JUNE 1991

[illegible]

Number of Assays

Fire Assays	715
Bullion	41
Daily Assays	245
Neutralization	257
Monthly Composites	30
Blast Holes	1549

A representative from Degussa spent a week here determining how to reduce hydrogen peroxide use. It was concluded that a flow meter and sampling port on the detox return line was needed.

The Reverse Osmosis unit was tested this month. Barren solution can be sufficiently "cleaned" with a double pass through the membranes. The residual cyanide must be treated with hypochlorite. The unit will be returned to Arrowhead due to insufficient volume of treated solution in lieu of a double pass trailer which can treat at least twice the capacity of solution per day.

Dave Sherman took one day of vacation on June 14 and Martha Wierzbicki took one day of vacation on June 26.

rl

MONTHLY REPORT

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

DATE: JUNE 4, 1991

TO: JIM THOMPSON

FROM: LAURA DAMON LLD

SUBJECT: MONTHLY REPORT - MAY 1991

[illegible]

Number of Assays

Fire Assays	1035
Bullion	27
Daily Assays	237
Neutralization	248
Monthly Composites	30
Blast Holes	1128
Exploration	26

_____. Lab production seemed to run smoothly in my absence.

rrl

MONTHLY REPORT

DATE: MARCH 5 1991
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - FEBRUARY 1991

Number of Assays

Fire Assays	938
Bullion	25
Daily Assays	214
Neutralization	224
Monthly Composites	30
Blast Holes	1401
Bottle Rolls	11
Exploration	50
Pitard Method	27

Metallurgical test columns continue to be analyzed to evaluate the effectiveness of calcium peroxide treated ore in regard to percent gold recovery and neutralization efficiency. The first set of columns indicated 10% less gold recovery for the calcium peroxide treated ore, however, the calcium peroxide treated ore neutralized with half the amount of ton solution/ton ore as the control column.

A second set of columns were run at a higher pH. Again, the calcium peroxide treated ore showed less percent gold recovery than the control column., although the percentage was reduced to 4% from 10%. The calcium peroxide treated ore appears to be neutralizing more efficiently but the testwork will not be completed for another week.

Valerie Dierks resigned as Laboratory Technician. Her last day will be March 7, 1991. I be [REDACTED].

DATE: FEBRUARY 5, 1991
TO: JIM THOMPSON
FROM: LAURA DAMON LLD
SUBJECT: JANUARY 1991 MONTHLY REPORT

<u>Number of Assays</u>	
Fire Assays	919
Bullion	27
Daily Assays	236
Neutralization	248
Monthly Composites	30
Blast Holes	1235
Bottle Rolls	20
Exploration	17
Pitard Method	43
Old Tailings	30

A new 810 DFC Assay Furnace was installed in the lab this month. It is working very well.

Samples of the old mine tailings were assayed for moisture and gold. The moistures varied from 10% to 30% and most of the gold values were below .020 oz/ton.

Some blast hole samples have been prepped and assayed using the Pitard Method this month. No conclusions will be drawn until a sufficient database is prepared.

A set of columns were run to compare the percent recovery of calcium peroxide treated ore with a control. The CaO_2 treated ore showed 10% less recovery than the control. A low pH from the CaO_2 column could possibly explain the difference in recovery. The test will be rerun at a higher pH.

The entire lab personnel had lead level tests done this month. Everyone has low levels. [REDACTED] lead level actually dropped by about 50%, presumably due to the ventilation revamping in Fire Assay.

Valerie Dierks took five days vacation, Kim Ware took two days vacation, and Martha Wierzbicki took one day vacation this month.

DATE: JANUARY 3, 1991
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: DECEMBER 1990 MONTHLY REPORT

Number of Assays

Fire Assays	723
Bullion	24
Daily Assays	236
Neutralization	248
Monthly Composites	30
Blast Holes	865
Bottle Rolls	8

The CO₂ Unit was installed this month to bring down the pH on 31-7. It took about 2 weeks and 2 loads of CO₂ to lower the pH. Some CO₂ was lost through the vent on top of the tank.

The last samples from the lysimeter study were analyzed for bacteria by Twin City Testing. No bacteria was found in any of the lysimeter samples.

Bottle rolls were done for a comparison on recovery between 3/8" and 1" ore samples. On the average the 3/8" material showed a 13% increased recovery.

SLS (Sulfide Leach Study) samples were rolled for 21 days to determine the amount of line consumption.

The 1/2" material showed 9#/ton lime consumption in the 3 week time period.

Martha Wierzbicki, Kim Ware, and Mike McFarland used their remaining vacation time this month.

DATE: FEBRUARY 1, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: JANUARY 1990 MONTHLY REPORT

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	888
BULLION	22
DAILY ASSAYS	217
NEUTRALIZATION	186
MONTHLY COMPOSITES	30
BLAST HOLES	1205
INTERIM COLUMN LEACH	99

The laboratory computer was ordered this month. It is scheduled for installment Feb. 1st.

The Interim Column Leach Testing Program is in progress. The column construction is near completion and preliminary parameter testwork has been started. ACZ Laboratories has been chosen for our quality assurance lab. We are waiting for ACZ parameter results to compare with Brohm results. The screening for "Chemistry of Fines Procedure" is about half way done on the spent ore from Cell #1. Our target date for screening completion is Feb. 8.

The first samples for the "Round Robin" sample exchange program were delivered Jan. 29. Brohm, Bond, Golden Reward, and Homestake are the labs involved. The program was accepted with enthusiasm.

Laura Damon

Laura Damon

DATE: MARCH 1, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: FEBRUARY 1990 MONTHLY REPORT

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	560
BULLION	29
DAILY ASSAYS	196
NEUTRALIZATION	202
MONTHLY COMPOSITES	30
BLAST HOLES	1167
INTERIM COLUMN LEACH	76

Construction on the columns for the Interim Neutralization Study has been completed. The columns were filled with Cell #3 material, but due to the non-liming of the ore, the columns had to be unloaded and refilled with material with a proper pH. The column ore is representative of the ore that will go on Cell #5. We are waiting for the pH of the barren and on solution to stabilize before putting the columns on leach. They will be run in parallel with Cell #5.

The Chemistry of Fines screening has been completed. Batch tests will be finished during the first part of March.

Homestake has agreed to be our quality assurance lab for WAD CN.

Laura Damon

Laura Damon

LD/rrl

DATE: MARCH 30, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MARCH 1990 MONTHLY REPORT

Number of Assays

Fire Assays	604
Bullion	17
Daily Assays	217
Neutralization	224
Monthly Composites	30
Blast Holes	1,208
Interim Neut. Study	240

The columns for the Interim Neutralization Study were put on leach March 19. The barren and on solutions pH stabilized after Cell #5 was put on leach.

The Batch Testing for the "Chemistry of Fines" was finished this month and the results sent to the consultants and Tom Durkin (DWNR).

MSHA held an inspection in the Laboratory. Everything checked out fines.

Bottle testing to determine the leachability of Au and Ag for Anchor Hill ore was completed this month.

Laura Damon

LLD/rrl

DATE: APRIL 30, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: APRIL 1990 MONTHLY REPORT

Number of Assays

Fire Assays	842
Bullion	19
Daily Assays	228
Neutralization	240
Monthly Composites	30
Blast Holes	1,201
Interim Neut. Study	360
Exploration	67

The columns for the Interim Neutralization Study are 40 days through the 60 day leach period. They show an average of 60% recovery to date. They will be put on the neutralization cycle in May.

The loaded carbon sent to Sparks, Nevada was assayed this month. The assays averaged 274.36 oz/ton Au.

A report of the mine history to date for recovery and neutralization should be near completion during May.

April has been a month of maintenance problems in the lab. The bearings in the Bottle Roll burned out and were replaced. The air compressor in sample prep continues to be a problem. It loses pressure frequently and blows water and oil at times. A set of new rings and valves and a dryer may fix the problem. This has been being looked into for months. The baghouse lines have been freezing during cold days and snow. A dryer could also eliminate this problem. A bolt bent on one of the pulverizer clamping arms loosening the bowl and rings. This is a potentially hazardous condition as the rings flew out of the pulverizer. Fortunately, they did not strike anyone. More frequent maintenance inspections seem to be in order. The Fire Hose water line has not been re-connected since the valve was removed. During an MSHA inspection in March, it was found that our ventilation is not adequate for removing lead dust. MSHA will be here May 7 to look into the problem. Lance Hubbard tried to do a respirator fit test on Kathy Groce and Bill Atkinson without success. He said he will try again.

Martha Wierzbicki took three days funeral leave and two days vacation this month.

Laura Damon

Laura Damon

LLD/rrl

DATE: JULY 3, 1990

TO: JIM THOMPSON

FROM: LAURA DAMON

SUBJECT: ^{JUNE}~~MAY~~ 1990 MONTHLY REPORT

DRAFT

Number of Assays

Fire Assays	550
Bullion	36
Daily Assays	228
Neutralization	240
Monthly Composites	30
Blast Holes	1,427
Interim Neut. Study	395
Exploration	20

Laura Damon

LLD/rrl

DATE: AUGUST 1, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: JULY 1990 MONTHLY REPORT

<u>Number of Assays</u>	
Fire Assays	570
Bullion	41
Daily Assays	236
Neutralization	248
Monthly Composites	30
Blast Holes	1,362
Interim Neut. Study	170

The Interim Neutralization Study will be completed in its entirety by the middle of August. Thus far, the results show no cyanide retention in the ore from any of the columns or Cell #5 when off-loaded at an effluent WAD cyanide concentration of 2 ppm or less.

The second shipment of loaded carbon was assayed this month yielding 496.931 total ounces of gold.

Laura Damon

Laura Damon

LLD/rrl

DATE: OCTOBER 1, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: SEPTEMBER 1990 MONTHLY REPORT

Number of Assays

Fire Assays	573
Bullion	18
Daily Assays	228
Neutralization	240
Monthly Composites	30
Blast Holes	1,248
Lysimeters	360
Exploration	87

The Interim Neutralization Study was completed this month. The results appear favorable for off-loading at 2 ppm WAD cyanide heap effluent and 0.5 ppm WAD cyanide solid sample at the worst scenario. The final report from Adrian Smith and Terry Mudder will be completed by mid-October. Tom Durkin said the state will be able to reach a decision within a week of receiving the final report.

A new DFC cupellation furnace has been in use in Fire Assay this month. It is working beautifully. The two remaining Gress furnaces have been having a great deal of down time, needing replacement parts frequently. Jim Thompson said a DFC 810 furnace would be ordered on September 25th. The new furnaces will be a great improvement to Fire Assay.

The ventilation in Fire Assay was fixed during the week of September 10th. A bigger intake pipe was put on the bottom of the flux table. The improvement in air suction is quite apparent. MSHA was in the lab September 18th and 19th. A testing program was conducted on Martha Wierzbicki for lead exposure and Dave Sherman for dust exposure.

The five-foot columns in the met lab were loaded to compare gold recovery between 1-inch and 1½-inch crushed ore. The study will commence October 1.

Jim Rouse from GeoChem was here September 27th and 28th. He was given the lysimeter leach data. He brought soil from our column tests at GeoChem and we are in the process of culturing cyanide degrading bacteria to use in neutralization for 31-7 lysimeter data.

The barrels outside the lab were cleaned out and organized. The ground around the lab needs to be graded to keep water from flooding sample prep. We have been cleaning and painting the floors inside the lab.

██████████ has been absent since August 13th with a back injury. ██████████ on ██████████ y 23. She is scheduled to return to work October 1.

Laura Damon

Laura Damon

LLD/rrl

DATE: NOVEMBER 5, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: OCTOBER 1990 MONTHLY REPORT

Number of Assays

Fire Assays	984
Bullion	27
Daily Assays	236
Neutralization	248
Monthly Composites	30
Blast Holes	1,516
Lysimeters	372
Exploration	162
Bottle Rolls	12

Kim Ware returned to work October 1 from maternity leave. Kathy Groce quit on October 11.

The lysimeter heap (31-7) was put on neutralization at the beginning of the month. Cyanide degrading bacteria were cultured and added to two of the lysimeter clusters. The lysimeter samples have been monitored for WAD cyanide on a daily basis. To date, the bacteria have not seemed to help neutralization. The study should be completed late November or early December.

The crusher samples are now being prepped according to the Sampling Method suggested by Francis Pitard.

Laura Damon

Laura Damon

/rrl

DATE: DECEMBER 5, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: NOVEMBER 1990 MONTHLY REPORT

Number of Assays

Fire Assays	965
Bullion	19
Daily Assays	228
Neutralization	240
Monthly Composites	30
Blast Holes	1,165
Lysimeters	360
Exploration	52
Bottle Rolls	8

The last lysimeter samples were collected from 31-7 on 11/29 and sent to Twin City Testing for total plate counts on bacteria. No bacteria had been found in the lysimeter samples at the end of the leach cycle or beginning of the neutralization period. The lysimeter data collected throughout the neutralization period supports the idea of channeling in the heaps. Cyanide enriched areas were found in one 15 foot sample and two 20 foot samples.

31-7 did not pass pH during neutralization compliance testing, although it passed for WAD cyanide. A carbon dioxide unit will be employed to lower the pH of the neutralization solution and subsequently lower the pH of the heap effluent. It appears we may have a pH problem on some more heaps so pH must be monitored closely. The CO2 unit will be in line to lower the pH of any other problem heaps. Nalco must be contacted to adjust the anti-scalent in the Neut System when the CO2 unit is on-line.

The lab test columns (agglomerated vs. unagglomerated ore) have been put on neutralization. The agglomerated ore showed a 10% better gold recovery (82%) than the unagglomerated ore (72%) but the gold head grades on the columns differed significantly. The gold recoveries will be re-assessed at the end of the study when the tail assays are available.

A few sulfide leach study (SLS) bottle rolls were run on the sulfide ore this month. These preliminary tests showed 30% gold recovery on the 1/2" ore and 18% gold recovery on the 1" ore. Both the 1/2" and 1" ores showed about 3.5 #/ton cement consumption and 1 #/ton NaCN consumption in 4 days. A bottle roll is being done now to determine cement and cyanide consumption over a 2-3 week period.

Grab samples from the 1/2" and 1" sulfide stockpiles were fire assayed to obtain a head grade for the gold. Two grab samples were collected from each pile. Each sample was split as is, (non-crushed) to 300 grams. The reject was crushed to -10 mesh and split to 300 grams. The splits were pulverized to -150 mesh and fire assayed five times each. The results are as follows:

<u>SAMPLE</u>	<u>Au (opt)</u>	<u>SAMPLE</u>	<u>Au (opt)</u>
1/2" - A non-crushed	.046	1/2" - B non-crushed	.108
1/2" - A crushed	.086	1/2" - B crushed	.094
1" - A non-crushed	.037	1" - B non-crushed	.043
1" - A crushed	.055	1" - B crushed	.055

The crushing step appears to lessen the gap between assays, at least on these few samples.

The lab AA was serviced this month and found to be in great condition. Other equipment seems to be in good order and running well.

Mike McFarland was hired to fill the Laboratory Assistand position. David Sherman was hired to fill the Sample Technician position. Valerie Dierks took a day of vacation on 11/21/90.

Laura Damon

/vhc

DATE: JANUARY 31, 1989
TO: DAN BLAKEMAN
FROM: LAURA DAMON
SUBJECT: JANUARY 1989 MONTHLY REPORT

<u>Number of Assays</u>	
Fire Assays	750
Bullion	8
Daily Assays	291
Neutralization	330
Column Leach	31
Monthly Composite	30

During the month of January the lab has continued monitoring the Neutralization of Pad #6. A colorimetric procedure for WAD cyanide determination has been worked up in lieu of distillation for samples with values greater than 1 ppm. This procedure is less time consuming and allows for a greater number of samples to be analyzed at one time.

A Column Leach Study has been on-going for 20 days. Nalco leach aid has been added to one of the columns. So far no apparent difference in % extraction has been detected between the column with leach aid and the column without leach aid.

Blast hole samples from S-10-4, S-10-6, S-11-1, and S-11-2 are being rerun. The reruns are averaging 25% higher than the original assays. This has brought the grade of the ore close to the predicted values.

The motor and pulley in the dust collection system were modified resulting in improved ventilation.

All of the laboratory personnel attended an eight hour safety refresher course this month.

Laura Damon

LD/dvl

DATE: FEBRUARY 28, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: FEBRUARY 1989 MONTHLY REPORT

NUMBER OF ASSAYS

FIRE ASSAYS	283
BULLION	8
DAILY ASSAYS	177
NEUTRALIZATION	224
COLUMN LEACH	52
MONTHLY COMPOSITE	30
NaCN SHAKE	184

The Blast Hole Reruns were completed in Fire Assay this month. All the reruns were consistently higher than the previously run samples. The Rerun Blast Hole Samples were pulled at random to do NaCN Shakes. These samples checked well with the previous NaCN Shakes.

A matte sample from Lot #18 was analyzed and found to have 95% iron. Solution Assays were run by the Pb-Acid Method on Preg, Barren, On, and Column A & B Composites giving excellent checks with the A.A. values.

Perkin-Elmer came out to replace an analog board in the AA. Since they were in Deadwood when the AA went down they came out at no charge and the board was covered under warranty. Lights were installed in the Fire Assay ventilation hood and Furnace #3 was rebuilt.

The Column Leach Study on Heap #7 was completed. No positive effect was found using Nalco heap leach aid 8821. The untreated column yielded 68.72% cumulative gold extraction which was close to the projected 70% cumulative gold extraction value.

Laura Damon

LD/dvl

DATE: APRIL 4, 1989

TO: JIM THOMPSON

FROM: LAURA DAMON

SUBJECT: MARCH 1989 MONTHLY REPORT

NUMBER OF ASSAYS

FIRE ASSAYS	262
BULLION	11
DAILY ASSAYS	279
NEUTRALIZATION	196
COLUMN LEACH	160
MONTHLY COMPOSITE	30
NaCN SHAKE	166

During the month of March the Neutralization process was started on Heaps 3-6. Daily monitoring is being done on WAD cyanide and copper. Solid samples from Pad 6 were prepped in our lab for DWNR testing and sent to Travis Labs. A pH Column Leach Study and Soil Attenuation Study was conducted on material from Pad 6. Adjusting the pH with acid is not feasible according to the conclusions drawn from the studies.

Handy and Harman Bullions samples 013-017 were rerun giving excellent checks with D.C. Griffiths. Handy and Harman Bullion 013-022 and Broken Bullion 017-022 were delivered to the Refinery adding an estimated 3.5 ounces of gold to the March pour.

The motors on the blowers in Fire Assay were changed with seemingly good improved ventilation in the lab.

Brohm's lab prepped and fire assayed 21 Golden Reward samples this month. We are charging \$10 per sample.

Evaluations were done for the Lab personnel. Morale is improving due to incoming Blast Hole and Crusher samples. We're back on track!

DATE: APRIL 28, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: APRIL 1989 MONTHLY REPORT

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	723
BULLION	12
DAILY ASSAYS	270
NEUTRALIZATION	248
MONTHLY COMPOSITE	30
NaCN SHAKE	912
GOLDEN REWARD	137

During the month of April production has picked up considerably. We are almost back to the full production rate on blast hole samples. The neutralization of Heap 3 - Cell 1 has moved along quite satisfactory. We have added new procedures to our neutralization operation including analyzing for sulfates, nitrites, and Total Dissolved Solids on a weekly basis. The Picric Acid Method for analyzing WAD CN- has proven to be an excellent method for determining our daily WAD CN- level.

At the beginning of the month we conducted a Head - Tail % Soluble Loss Study using the remaining DWNR Solid Samples from Heap 1 - Cell 6. The data collected didn't provide a good data base due to the sample and not having the right equipment for filtering. Since then, we have installed our Pressure Filters and have obtained a good sample of the actual Spent Ore from Heap 1 - Cell 6. The procedure has been perfected and the study will be finished during the first week in May.

All three Assay Furnaces burned out elements this month. The elements have been replaced and all other equipment is running fine. The Fire Assay ventilation seems to be functioning well. The motor in the hood still needs to be hooked up.

55 blast hole samples and 6 crusher samples were sent to Chem Assay for quality checks. I am waiting for the results.

137 Golden Reward samples were fire assayed along with our own production.

We had one First Aid case. [REDACTED] got silicone spray in her eye. I flushed it for 15 minutes in our eye wash and took her to the clinic for further evaluation. Everything was ok.

Since we are back in full production, the vacancy in sample prep will be filled the first of May from In-hous posting. Ryan Fredrickson is filling in temporarily the last week of April.

Laura Damon

①
DATE : MAY 31, 1989

TO : JIM THOMPSON

FROM : LAURA DAMON

SUBJECT : MAY 1989 MONTHLY REPORT

NUMBER OF ASSAYS

FIRE ASSAYS	553
BULLION	13
DAILY ASSAYS	279
NEUTRALIZATION	248
MONTHLY COMPOSITES	30
NaCN SHAKE	1153
GOLDEN REWARD	324
EXPLORATION	4

Ryan Frederickson was hired this month to fill the Sample Tech vacancy. He has proven to be a fine addition to our laboratory team.

We have continued work on the neutralization process, using the Picric Acid method for WAD CN^- determinations exclusively due to consistently good results with the procedure.

A soluble loss study was completed on the spent ore from Heap 1-6 showing 3-4% soluble loss. Heap 3-1 head fractions have been assayed for the same study. We are waiting for Heap 3-1 spent ore to finish the study.

②

Heap 3-1 solid samples were prepped by us for the DWNR conclusions done by Travis Lake.

Our Handy & Harman refinery bullion ~~was~~ assays have been checking consistently with D.C. Griffith. I sent out a memo recommending the termination of D.C. Griffith assaying services.

The quality control assays from Chem Assay came back with good checks on our Blast Hole and Crusher samples. Starting in June we will send only 10 samples per month for control checks.

We have continued with a 24 hr. turn around time on Blast Hole samples.

We tested the sludge in the 50-ml centrifuge tubes for CN^- content and found it to be ~ 400 ppm CN^- . We will start putting our used tubes in 55-gal drums and having them hauled to the cyanide containment area.

The freshly exposed tailings from the area being reclaimed shows four lbs/ton total consumption of lime.

We continue to work ^{up} new procedures including nitrate, ammonia, and Calcium.

DATE: JUNE 30, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: JUNE 1989 MONTHLY REPORT

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	275
BULLION	17
DAILY ASSAYS	270
NEUTRALIZATION	352
MONTHLY COMPOSITES	30
NaCN SHAKE	618
GOLDEN REWARD	371

June has been a relatively smooth running month for the laboratory. We changed our schedule to 7:00 am - 3:30 pm on June 12th. The schedule change has improved the daily flow in the lab and provides daily assays completed by noon.

All the lab bullion dore' was sent to the refinery for June's pour.

Martha Herbert has a lead level of 22.

The Heap 3 - Cell 1 Spent Ore Study was completed this month showing 4% soluble loss.

We did a pH vs. amount of lime/ton of ore bottle roll test. It indicated we should be adding 2 lbs of lime per ton of ore to maintain a pH of 10.0 - 10.5.

A test was done with steel punchings and lead shot on the destruction of hydrogen peroxide in the surge pond solution. The steel punchings did not destroy the hydrogen peroxide. The hydrogen peroxide was destroyed presumably by the lead shot after 3 days of contact in a beaker.

We are in the process of running a neutralization diffusion study on our columns using different flow rates. The test data will be collected by early next month.

Laura L. Damon

Laura Damon

LD/dvl

MEMORANDUM

TO: JIM THOMPSON
FROM: LAURA DAMON
DATE: JULY 31, 1989
SUBJECT: MONTHLY REPORT - JULY 1989

NUMBER OF ASSAYS

Fire Assays	431
Bullion	16
Daily Assays	310
Neutralization	368
Monthly Composites	30
NaCN Shake	966
Column Testing	281

Neutralization column testing has proceeded throughout the month of July. A formal report will be written when I obtain conclusive data. I submitted a proposed on-off loading heap leach schedule for the rest of 1989 and through 1990 based on the neutralization data collected thus far.

Martha Herbert and Kim Ware were given their yearly evaluations. Martha took her first week of paid vacation this month. A wet lab technician position has opened this month due to Ernie Millburn being transferred to a Utility Person position.

Solid samples were prepped for Cells 2, 3, and 4 to be sent to Travis Labs.

Furnance 1 and 3 burned out elements in fire assay. They were fixed promptly.

Laura L. Damon

Laura Damon

LD/st

DATE: AUGUST 31, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - AUGUST, 1989

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	782
BULLION	10
DAILY ASSAYS	248
NEUTRALIZATION	186
MONTHLY COMPOSITES	30
NaCN SHAKE	976
COLUMN TESTING	227
EXPLORATION	21

This month laboratory testing included carbon column-bottle roll tests, spent ore % soluble loss on 4-2, 5-3, 6-4, and continued column neutralization tests.

Ernie Millburn was given his yearly evaluation and transferred to a Utility Person position. Valerie Dierks was hired to fill the vacant Wet Lab Technician position. Her starting day was August 28. Kim Ware took a week of vacation during the first part of the month. [REDACTED] strained her back while dumping a 55-gallon drum of ore. An accident report was filed with Lance Hubbard. This was not a lost time accident.

The power supply board went out on the centrifuge. The board was replaced under warranty and the centrifuge is in good working order now. The lab balances were cleaned by Northern Balance Systems. The analytical balance is drifting badly. It will be sent to O'Haus to be fixed.

Information from our on-going column neutralization testwork was compiled and samples from Heap 8-7 leach ore, Heap 8-7 head ore, and waste dump spent ore was screened and prepped for Dan Blakeman.

The lab personnel had a meeting for refreshing first aid knowledge and reviewing emergency procedures.

Laura Damon

Laura Damon

LD/dv1

DATE: AUGUST 31, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - AUGUST, 1989

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	782
BULLION	10
DAILY ASSAYS	248
NEUTRALIZATION	186
MONTHLY COMPOSITES	30
NaCN SHAKE	976
COLUMN TESTING	227
EXPLORATION	21

This month laboratory testing included carbon column-bottle roll tests, spent ore % soluble loss on 4-2, 5-3, 6-4, and continued column neutralization tests.

Ernie Millburn was given his yearly evaluation and transferred to a Utility Person position. Valerie Dierks was hired to fill the vacant Wet Lab Technician position. Her starting day was August 28. Kim Ware took a week of vacation during the first part of the month. [REDACTED] strained her back while dumping a 55-gallon drum of ore. An accident report was filed with Lance Hubbard. This was considered a lost time accident.

The power supply board went out on the centrifuge. The board was replaced under warranty and the centrifuge is in good working order now. The lab balances were cleaned by Northern Balance Systems. The analytical balance is drifting badly. It will be sent to O'Haus to be fixed.

Information from our on-going column neutralization testwork was compiled and samples from Heap 8-7 leach ore, Heap 8-7 head ore, and waste dump spent ore was screened and prepped for Dan Blakeman.

The lab personnel had a meeting for refreshing first aid knowledge and reviewing emergency procedures.

LLD dv1

Laura Damon

LD/dv1

DATE: OCTOBER 2, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - SEPTEMBER, 1989

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	85
BULLION	3
DAILY ASSAYS	87
NEUTRALIZATION	126
MONTHLY COMPOSITES	30
COLUMN TESTING	184
EXPLORATION	23

Due to the lining of the pad, September was a slow month in the lab. Ryan Fredericksen helped work on the pad for about 3 weeks. Martha Herbert took her final week of vacation during the first part of the month. Kim Ware took her final week of vacation at the end of the month. Kathe Groce took a leave of absence due to her mother's illness. She should return during the first part of October.

Testwork included Carbon-Loading Bottle Rolls, 7-5 Spent-Ore, and continued Column Neutralization Study.

An estimated 10 ounces of gold was delivered to the refinery in the form of Assay Bullion.

Laura Damon

Laura Damon

LD/dvl

DATE: OCTOBER 31, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: MONTHLY REPORT - OCTOBER, 1989

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	720
BULLION	18
DAILY ASSAYS	217
NEUTRALIZATION	186
MONTHLY COMPOSITES	30
COLUMN TESTING	104
NaCN SHAKE	828
EXPLORATION	122

Laboratory production ran very smoothly for the month of October.

The back-up battery for the Centrifuge's RAM system went out. The part was sent to us and Keith fixed it with instructions over the phone. The water softener was installed for our RO water system. It is now in operation. The drain for it still needs to be modified.

Kathe Groce returned October 11 from her excused leave of absence. [REDACTED] had her lead level checked October 28. The results are not back yet.

Column Testing for Neutralization has continued this month. The focus is on drain time vs. time for WAD CN- to decrease.

A Round Robin Sample Exchange Program is being organized for all the Northern Black Hills Mines. All the mines have shown interest in the program. We hope to start exchanging samples by the end of next month.

Laura Damon

Laura Damon

LD/dvl

DATE: NOVEMBER 30, 1989
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: NOVEMBER 1989 MONTHLY REPORT

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	428
BULLION	17
DAILY ASSAYS	197
NEUTRALIZATION	180
MONTHLY COMPOSITES	30
COLUMN TESTING	72
BLAST HOLES	538
EXPLORATION	38

Laboratory production continued to run smoothly for the month of November.

Our AA was cleaned and checked by Perkin-Elmer. The instrument is running well.

We met with consultants to plan the solid sampling vs effluent column testing program. We are presently doing preliminary testwork on preservation techniques and parameter methods.

Laura Damon

Laura Damon

LD/dv1

DATE: JANUARY 2, 1990
TO: JIM THOMPSON
FROM: LAURA DAMON
SUBJECT: DECEMBER 1989 MONTHLY REPORT

<u>NUMBER OF ASSAYS</u>	
FIRE ASSAYS	377
BULLION	8
DAILY ASSAYS	217
NEUTRALIZATION	180
MONTHLY COMPOSITES	30
BLAST HOLES	473

The month of December was a slow and uneventful month.
Laboratory production continued to run smoothly.

Kathe Groce had two weeks vacation. [REDACTED] is [REDACTED] and
[REDACTED] [REDACTED] [REDACTED]

Laura Damon

Laura Damon

LD/dv1

MEMORANDUM

TO: Dan Blakeman
FROM: Laura Damon
DATE: October 4, 1988
SUBJECT: Monthly Lab Report - September 1988

	No. of Assays
Fire	788
NaCN Shake	702

The lab started production this month. The crusher heads have been assayed since August 25, 1988. In the beginning there seemed to be a problem duplicating assay splits. The crusher head sample prep procedure has been refined throughout the month producing good replication for the assay splits.

The lab started receiving blast hole samples in mid-September before Sample Prep was set up and ready for production. All of the blast hole samples had to go to Bondar-Clegg until Sample Prep got their second drying oven and air lines connected. A procedure has been adopted to bring sample prep up to production level during a one to two week interval. Eighty blast hole samples were prepped the first day and a few samples will be added every day until production level of 140 samples per day is reached.

The Hot NaCN Shake procedure is working well. The procedure was changed from a 2:1 dilution factor to a 1:1 direct reading hoping to eliminate multiplication error.

Any shake samples reported between .01 and .02 will be checked by fire assay. At least 500 shake samples will be checked by fire assay to get a comparison between the two procedures.

The furnances in fire assay are very slow to recover (40 minutes) therefore, taking up to two hours to fuse a load. Keith is looking into a change in the transformer wiring to correct the problem. The ventilation system in fire assay does not provide adequate ventilation. Something needs to be done to correct this situation. Martha is being monitored frequently for Blood Lead Levels.

LD:st

TO: Dan Blakeman

FROM: Laura Damon

DATE: Nov. 1, 1988

SUBJECT: Monthly Lab Report - October 1988

	No. of Assays
Fire	646
NaCN Shake	2,207
Bullion	18
Precipitate	5


CN⁻

~~Sample Prep~~ was brought up to

Kathy Grace started work in Sample Prep. Oct. 5.

Sample Prep was brought to production level during the beginning of first week of Oct. After Kathy was trained in Sample Prep Ernie was moved to the wet lab to help Kim catch up on NaCN Shakes.

X The wet lab got f behind on NaCN Shakes due to washing 50-ml Centrifuge Tubes. There is not enough time to do both in 8 hours. It cost 68¢ + a tube to wash ^{w/OT.} when they cost .14¢ a piece. I do not see the logic in this.

 lead level was up to 30 discovered ~~7th~~ Oct. 12th. Both she & f had our blood tested the morning of Oct. 13. I pulled her out of the Fire Assay Lab to wait for the results. Her results came back as 30 again on Oct. 18 so I put her back in the lab.

Nov. monthly totals for LAB

AA AND FIRE Sample totals = 801

AA Blast hole Samples 272

Exploration 84

tails 35

Cons 35

FIRE Priorities 358

Total 512

Bullion 15

Precip 02

Prepared by Martha Heyburn
Jacks & Sons

DATE: DECEMBER 28, 1988
TO: DAN BLAKEMAN
FROM: LAURA DAMON
SUBJECT: DECEMBER 1988 MONTHLY REPORT

NUMBER OF ASSAYS

FIRE ASSAYS	258
BULLION	11
PRECIPITATION	1
DAILY ASSAYS	291
NEUTRALIZATION	248

December has been a fairly quiet month for the laboratory. There haven't been any blast hole or crusher samples this month. This has given us time to organize our working area. We have been working on the neutralization of Pad #6 all month. The column leach cells were built and have been filled with crusher material from Heap #7. Kathe has started training in Fire Assay. John has been drafting for Geology for the entire month. [REDACTED] blood lead level is declining.

Laura Damon

LD/dvl